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Assistant Commissioner for Patents, Washington, D.C. 20231.

Patti Crowder
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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In The Application Of: Eldridge Et Al.

Application No.: 10/035,633

Filing Date: December 28, 2001

For: Electrical Contact Structures Formed By
Configuring A Flexible Wire To have A
Springable Shape And Overcoating The
wire With At Least One Layer Of A
Resilient Conductive Material, Methods
Of Mounting The Contact Structures To
Electronic Components, And Applications
For Employing The Contact Structures

Examiner: Unknown

Group Art Unit: 2841

SUPPLEMENTAL PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

In response to the Notice To File Corrected Application Papers, and prior to examination of the above-identified patent application, please amend the application as follows:

In The Abstract:

Please replace the existing abstract with the following abstract:

Contact structures exhibiting resilience or compliance are formed. The contact structures may be formed on a sacrificial substrate. The contact structures are attached to an array of electrical connections on a substrate to form a contact assembly. The electrical connections on the substrate may be metallic pads.

REMARKS

By this Preliminary Amendment, Applicants have amended the Abstract so that it does not exceed 150 words, as required by the Notice To File Corrected Application Papers. A version of the Abstract marked to show changes is attached hereto as is a clean copy of the Abstract on a separate sheet of paper.

Although Applicants believe that no extension of time is needed and all required fees have been authorized in papers filed herewith, Applicants hereby petition the Commissioner for any extension of time deemed necessary for acceptance of this paper, and Applicants hereby authorize the Commissioner to charge any fee deemed necessary for acceptance of this paper (or refund any overpayment of fees) to Deposit Account No. 50-0285 (order no. P83-US).

Respectfully submitted,

Date: April 15, 2002

By:



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VERSION WITH MARKINGS TO SHOW CHANGES

In The Abstract:

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Contact structures exhibiting resilience or compliance [for a variety of electronic components] are formed[by bonding a free end of a wire to a substrate, configuring the wire into a wire stem having a springable shape, severing the wire stem, and overcoating the wire stem with at least one layer of a material chosen primarily for its structural (resiliency, compliance) characteristics. A variety of techniques for configuring, severing, and overcoating the wire stem are disclosed. In an exemplary embodiment, a free end of a wire stem is bonded to a contact area on a substrate, the wire stem is configured to have a springable shape, the wire stem is severed to be free-standing by an electrical discharge, and the free-standing wire stem is overcoated by plating. A variety of materials for the wire stem (which serves as a falsework) and for the overcoat (which serves as a superstructure over the falsework) are disclosed. Various techniques are described for mounting the contact structures to a variety of electronic components (e.g., semiconductor wafers and dies, semiconductor packages, interposers, interconnect substrates, etc.), and various process sequences are described. The resilient contact structures described herein are ideal for making a "temporary" (probe) connections to an electronic component such as a semiconductor die, for burn-in and functional testing. The self-same resilient contact structures can be used for subsequent permanent mounting of the electronic component, such as by soldering to a printed circuit board (PCB). An irregular topography can be created on or imparted to the tip of the contact structure to enhance its ability to interconnect resiliently with another electronic component. Among the numerous advantages of the present invention is the great facility with which the tips of a plurality of contact structures can be made to be coplanar with one another. Other techniques and embodiments, such as wherein the falsework wire stem protrudes beyond an end of the superstructure, or is melted down, and wherein multiple free-standing resilient contact structures can be fabricated from loops, are described.] The contact structures may be formed on a sacrificial substrate. The contact structures are attached to an array of electrical connections on a substrate to form a contact assembly. The electrical connections on the substrate may be metallic pads.